Ogawa Docket No. OGW-037 GBC Docket No. 4386.77980

(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of	:	
Kazuhito Yanadori	:	
Serial Number: 10/691,583	:	Confirmation No.: 9481
Filed: October 24, 2003	:	Group Art Unit: 1772
For: POWER STEERING HOSE	:	Examiner: C. P. Bruenjes

DECLARATION UNDER RULE 37 C.F.R. 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Kazuhito Yanadori, do hereby declare as follows:

1. That I am a citizen of Japan, residing at c/o The Yokohama Rubber Co., Ltd., Hiratsuka Factory, 2-1, Oiwake, Hiratsuka-shi, Kanagawa-ken, Japan; that in March 1991, I graduated from the Master Course in the Division of Applied Chemistry, Graduate School of Engineering, Niigata University, Niigata-ken, Japan; that since April 1991, I have been employed by The Yokohama Rubber Co., Ltd., a Japanese corporation, of 36-11, Shimbashi 5-chome, Minato-ku, Tokyo, Japan, the Assignee of record in the above-identified subject application; and that in the above-named corporation, I have been engaged in research and development mainly in the field of reinforcing fibers for hoses up to present since July 1995.

2. That I am the sole inventor of the invention described and claimed in the subject United States Patent Application Serial Number 10/691,583 (hereinafter referred to as the present application), and as such, am fully familiar with the contents of the claims and specification of the present application (hereinafter

referred to as the present invention) and also of the prior art references cited by the Examiner during prosecution of the present application.

3. That I have specifically perused and clearly understand the contents of U.S. Patent No. 3,011,525 issued to Randle et al. (hereinafter Randle) and also U.S. Patent No. 5,660,210 issued to Ikeda et al. (hereinafter Ikeda)

4. That in connection with the claims of the present application and the Examiner's cited prior art references, I submit the following opinions as an expert declaration:

Opinions

5. In the claims of the present application, the twisted cords have an intermediate elongation at 0.85 cN/dtex of 2.2 to 5.0%, an elongation at break of 8 to 19 % and a number of twists of 15 to 30/10 cm, respectively.

Randle arguably teaches a high pressure hose having a rubber tube 5, a polyethylene terphthalate braided sleeve 7, a rubber interlayer 8, a rayon braided sleeve 9, and a rubber cover layer 10 (Randle at Figure 1, column 2, lines 56-70).

However, the non-final Office Action of September 7, 2005 rejected Claims 1-4 and 6 under the combination of Randle and Ikeda, but admitted that Randle fails to disclose, teach or suggest an intermediate elongation at 0.85 cN/dtex of 2.2 5o 5.0 % or an elongation at break of the twisted cords (the Office Action at pages 2-3). The final Office Action of March 30, 2006 maintained this rejection of Claims 1-4 and 6.

The September 7, 2005 Office Action contends that "whether the hose is used as a power steering hose or a hydraulic braking hose is not germane to the patentability of the article" (Office Action at page 3).

In response to this contention, please note that Randle arguably relates to "hoses used in hydraulic braking installations for vehicles". A power steering hose is for transferring a high-pressure pulsed fluid flow of which the pressure changes constantly. Such a hose, used under such a severe condition, that it

suffers from fatigue due to the periodic high pressure variations. Thus, a power steering hose is required to possess a high-degree of durability, which is incomparable with the required durability in the case of a braking-use hose, as disclosed in Randle which hose transfers a simple high-pressure fluid flow free of pulsation.

In addition, Randle fails to contain a reference to a power steering hose.

Ikeda arguably teaches the presence of a tubular rubber layer 1, a lower tread layer 2, an intermediate rubber layer 3, an upper or outer thread layer 4 and a cover rubber layer 5 (Ikeda at Figure 1, column 4, lines 47-54).

Ikeda arguably teaches the presence of the lower thread layer including a polyester, thread having a tensile strength of 8 grams or more per unit denier, an elongation of 10±1.5 % and a loaded elongation of 2.7±1.0 % per unit denier under 3-gram load (Ikeda at column 2, lines 33-37).

Within the claims, however, the twisted cords have an intermediate elongation at 0.85 cN/dtex of 2.2 to 5.0 %.

Yet, the Office Action has failed to provide any objective teaching to show that the lower thread layer found within Ikeda, which includes the characteristics of a tensile strength of 8 grams or more per unit denier, an elongation of 10 ±1.5 %, and a loaded elongation of 2.7 ±1.0 % per unit denier under 3-gram load are the same characteristics of an intermediate elongation at 0.85 cN/dtex of 2.2 to 5.0 found within the claimed invention.

In this regard, no equivalence within the Office Action has been established between those characteristics of the lower thread layer found within Ikeda and the claimed intermediate elongation at 0.85 cN/dtex of 2.2 to 5.0.

Within the claims, the twisted cords have an elongation at break of 8 to 19 %. In this regard, the non-final Office Action fails to show where within Ikeda that this feature can be found. As such, the non-final Office Action and the Final Office Action of March 30, 2006 are inadequate.

In addition, Ikeda fails to disclose, teach or suggest a number of twists of 15 to 30/10 cm, as claimed. Specifically, Ikeda is silent as to the number of twists.

Ikeda arguably relates to "a layered rubber hose used for passage of a pressurized fluid". Yet, Ikeda fails to contain a reference to a power steering hose.

The intermediate elongation (at 3 g/d) = 2.7±1.0 % recited in Ikeda may reasonably be converted to a value at "0.85 cN/dtex", the unit used in the definition of the intermediate elongation in applicant's Claim 1. The converted value is far below the range of the intermediate elongations of (at 0.85 cN/dtex) 2.2 to 5.0 % defined in applicant's Claim 1, as reviewed below.

First, to convert the load used in the measurement according to Ikeda, "3 g/d", to a value at the cN/dtex" unit, since the relationship between denier (d) and dtex and that between gf and cN are that 1d = (1/1.111) dtex and that 1 gf = 9.8×10^{-1} cN, we may obtain 3 g/d = 3.84 cN/dtex.

Therefore, assuming that the S-S curve of the fiber is linear, the intermediate elongation of Ikeda, (at 3g/d) = 2.7±1.0 %, may be converted to a value at the unit (0.85 cN/dtex) of the intermediate elongation recited in Claim 1 to obtain an intermediate elongation (at 0.85 cN/dtex) = 0.60±0.2 %.

When compared with (at 0.85 cN/dtex) = 2.2 to 5.0 %, the intermediate elongation defined in Claim 1, the above found intermediate elongation value, (at 0.85 cN/dtex) = 0.60 ±0.2 %, is seen to be considerably small or low.

When the intermediate elongation (at 0.85 dN/dtex) of a twisted cord used in a reinforcing layer is that low, a power steering hose made with that twisted cord could not attain the remarkable durability attained by to the claimed invention.

Thus, the non-final Office Action and Final Office Action have failed to show that Randle and Ikeda, either separately or in combination, would result in the claimed invention.

6. Further, in the above conversion concerning the intermediate elongation of Ikeda, it is assumed that "the S-S curve of the fiber is linear". The S-S curve

represents a relationship of the elongation and the tensile stress of a fiber, wherein within a range in which the tensile stress is relatively small (namely a range in which the tensile stress does not exceed the yield stress), the elongation and the tensile stress are in a proportional or linear relationship, and the range in which such proportional relation is established is called the elastic deformation region. When the tensile stress exceeds the yield stress, the proportional relationship between the elongation and the tensile stress no longer stands. The region in which the above proportional relationship is not established is called the plastic deformation region. The S-S curve shows the relationship between the elongation and the tensile stress of fiber in the elastic deformation region and in the plastic deformation region. Although the relationship is linear in the elastic deformation region, it as a whole involves a portion represented by a curve, and because of this, generally the representation of the relationship is by means of an S-S curve.

7. The intermediate elongation of fiber represents a characteristic of the fiber in the elastic deformation region, so in this discussion of the intermediate elongation it can be assumed that the elongation and the tensile stress of a fiber are substantially in a proportional relationship. Therefore, discussing the intermediate elongation of a fiber, it is reasonable to persons skilled in the art to assume that the S-S curve of a fiber is linear.

8. In the case of Ikeda, the intermediate elongation of yarn refers to the "intermediate elongation of an individual thread or fiber", while the intermediate elongation defined in applicant's claims refers to the "intermediate elongation of a twisted cord comprising a plurality of fibers". The intermediate elongation in Ikeda and that in the claims of the present application refer to an elongation found *per unit* of fineness (denier or dtex), so that whether elongation is of single fibers or a twisted cord, the elongations have the same meaning. Consequently, it is appropriate to directly compare the single fiber elongation of Ikeda with the twisted fiber elongation of Claim 1.

The undersigned declarant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the above identified application or any patent issuing thereon.

Dated: February 11, 2008

Kazuhito Yanadori

Kazuhito Yanadori